The Mystery Behind Sequence Locks and Key Retainer Devices

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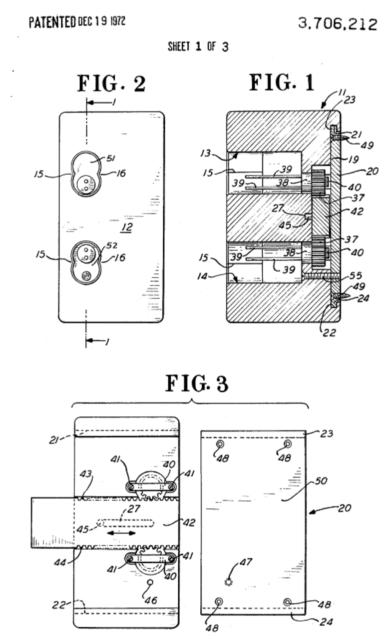
The production of the sequence lock ceased over a decade ago and is now obsolete. In its wake came the key retainer device. So, what exactly are sequence locks and key retainer devices? There has been some confusion and mystery surrounding these products. Let's begin by trying to distinguish the two by definition to slowly unravel the truth.

Definitions

The industry has not yet defined these two types of devices; however, these possible definitions may help differentiate them in the mind of the reader:

> ***sequence lock*** (SFIC version obsolete) - A locking device with a bolt, usually used in multiples, which requires a series of sequenced key removals to take place allowing the bolt to be engaged/retracted for doors/cabinets to be locked/unlocked in a specific order. (ex.; key removed from lock #1 is required to release a key from lock #2 ; key removed from lock #2 is required to release a key from lock #3, etc.).

> ***key retainer device* (KRD)** - A mechanical unit that is designed to securely retain one (or more) higher level key(s) captive until a user key is inserted, rotated and trapped, releasing the high level key(s). The user key is retained until the higher level key(s) is returned and rotated to the captive position, thus releasing the user key.

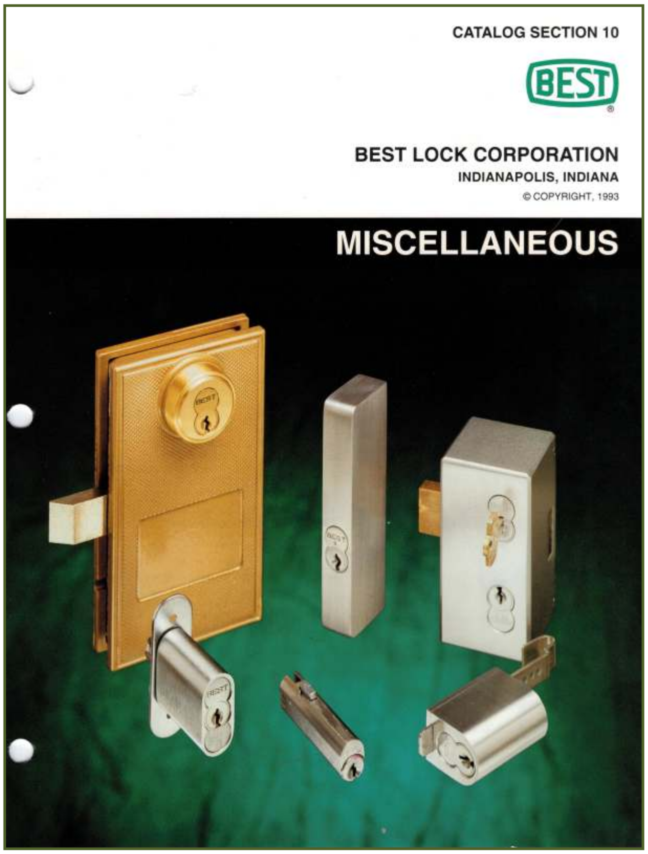


Now, let's take a look toward the history of these devices to better understand their construction, operation and application.

Historical Perspective

BEST Lock Company developed their first SFIC sequence lock in the early 1970s. It was under U.S. Patent number 3,706,212 and was granted December 19, 1972 to two gentlemen from New Jersey. It was later purchased and assigned to BEST.

Notice in the drawings that it is mounted vertically and contains a moveable bolt *(fig.3)*. This design of the



sequence lock was used for several decades, especially where doors need to be locked or unlocked securely in a particular order. This was used often times in the 'five & dime' stores. An employee would have the initial user key and would lock door number one by inserting the user key, turning to extend the bolt and securing the original user key, then releasing key #2. The employee would then proceed to door number two, insert key #2 turning to extend the bolt and securing key #2, then releasing key #3. The same would occur in sequence to the third door, and so on.

This sequence of events allowed for two things:

1) It guaranteed that all doors requiring locking were accomplished by doing so in a required order. No door could be 'accidentally' skipped and left open.

2) The individual keys would be securely retained so they could not be lost, stolen or duplicated, as only the first (or last key) would be non-retained.

The theory was sound and it worked well...until....

Problems in Sequence Paradise

In the preceding example, one can see that in order to open any door previously locked, the employee would need the last key to do so in order, from last door to first, or up to the door requiring opening. This could be a cumbersome and time-consuming activity.

With the advent of the panic bar and strengthening of fire code enforcement, the sequence locks used on certain exit doors became problematic. Bolts securing fire exit doors were not permitted.



Here is a picture of a BEST 23F sequence lock, with two cores, now discontinued. They could be ordered single-keyed (one side of the sequence lock) or double-keyed (from either side of the lock). Notice that the bolt is extended in this

picture.

Sometimes the sequence lock was used solely as a key retainer device, though the bolt was always there. That presented a possible security breach.

BEST had heard reports of college kids using a hammer to dislodge extended bolts, whereby stripping the gears and allowing either core to turn and release the keys. The end of the sequence lock was near.

Another problem that nagged users was that because of the vertical orientation of the device, keys hanging down would often inadvertently cover the lower core, making core identification (if face stamped) difficult. To follow is another picture of the sequence lock with cores and keys and this dilemma is clearly illustrated.



BEST decided in 2001 to discontinue the sequence lock based on low sales and simple lack of demand. Ultra Security, a BEST distributor exclusively for the U.S. Government for over 17 years and a manufacturer for some of the BEST product line, offered to re-engineer and manufacture the existing sequence locks as key retainers for BEST, as Ultra saw potential for them strictly as key retainer devices. But, BEST decided they wanted to wash their hands of the lock and subsequently sent over to Ultra Security the plans, designs and technical drawings with their blessings. Even though the sequence lock was officially dead, a new day and age for the key retainer device was being born.

Ultra Security Redesigns



From BEST's original design, John Ulaszek, President and Founder of Ultra Security, had a new vision for the old sequence lock. As an inventor and innovator (developer of the QU-I.C. System using color coding for SFIC), John saw a number of challenges that needed to be corrected in order for this lock to be resurrected as a viable key retainer device for the security market.

First, since the sequence lock would now be solely a key retainer device, the product would go 'boltless." This eliminated the security risk of pounding the bolt to release keys.

Second, because the vertical orientation was not suitable for good

visual key control, it was reformatted to a horizontal position. This also allowed for the cores to be set farther apart, especially important when using larger bow keys and numerous keys on a ring. Now a clear visual display of both cores and keys was not impeded.

Third, the brass throw pins were replaced with stainless steel, allowing for an even more secure retention of both keys. The block was extruded from airplane aluminum and was made completely in the USA.



Finally, to accommodate the larger IC market that was beyond the scope of BEST, Ultra Security designed the KRDs to accept not only SFICs, but LFICs as well, namely: Corbin Russwin, Sargent, Yale, Medeco and Schlage. 'Hybrids' that accept both SFIC on one side and LFIC on the other were also made, as well as the KRD-3. The versatility of the KRD-3 allows the device to be set to either retain two higher level keys with one release key, or more commonly, requiring two separate release keys (ex.: employee and supervisor) to release a higher level key. Ultra Security recognized the need in the market for these variations -- and they were 'spot on.'





A Twist of Fate

Since BEST stopped production of their sequence lock in 2001 and it was re-engineered by Ultra Security and marketed again by Ultra in 2003, the sales of the new KRD skyrocketed. Colleges, universities, government facilities and hospitals found the need for visual key control a 'necessity'. ICLS, a long-time distributor of the entire Ultra Security product line, has seen KRD sales steadily increase over the past decade. This is partially due to the extreme high quality of every product sold. And as matter of fact, there have been zero, yes, that's right, **zero** KRDs returned due to mechanical failure! That's a clear testament to the Ultra Security attention to detail not always found in today's manufacturing realm.

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Shortly after the redesign of the KRD, BEST asked to carry the line again. Thus, Ultra Security now sells them back to BEST for resale to their customers. Currently, BEST has the basic SFIC KRD-2 listed at $401 and the KRD-3 at $597. ICLS sells them at

$160 and $229, respectively. For the full line of KRDs, including the internal "S" switch and security seal, as well as the full line of the QU-I.C. System & Tools, visit: www.ICLSglobal.com.

Today

Especially since the tragedy of 9/11/01, facilities across the United States have come to realize that top master keys need not leave the premises. Computerized records supporting key control are great and often necessary, but there is nothing like quick, visual key control. For example, many hospitals attach a key to airplane cable connected to their $100,000 heart machine. The on-duty nurse can use the machine as authorized, but any supervisor can immediately see who has the machine out by looking at the specific key stamp on the retained key. College dorms love having the KRDs in the resident director's office so students locked out of their rooms can get quick access. Campus and city police stations use them for gun cabinets, and the list is endless.



Why should a custodian of a school have to take his/her top master key home at night? No real reason other than by habit...perhaps a 'bad habit.' However, if a KRD user key is lost or stolen, the single core can be quickly changed, as opposed to a costly building re-key. Or worse...no re-key at all!

Visual key control is not going away any time soon, even with the advent of electronic security systems. There seems to always be some mechanical override in the event of electronic failure. The KRD has been 'reinvented' by Ultra Security, and now, your job, is to think outside of the box. How and where can a KRD help your customers' security? The possibilities are endless.



William M. Lynk, CML, CPS, ICML, M.Ed, has been a locksmith since 1975, having attained a Bachelor's Degree from Kent State University (Kent, OH) and a Master's Degree from Cambridge College (Cambridge, MA). He is an Interchangeable Core Specialist, Certified ALOA *A.C.E.* Instructor and an ALOA *A.C.E.* Instructor-Trainer. Bill teaches classes on IC, High Security Cylinders and Master Keying through webinars, conventions, trade shows and for associations and corporations nationally. As an author of many related industry articles, Bill received the *Keynotes Author of the Year Award* in 2013. Additionally, he has penned **Interchangeable Cores: Small Format** ©2000, **Removable Cores: Large Format** ©2003, **SFIC: Advanced** ©2005, and a fourth, **IC Everything,** over 1,000 pages, ©2014, is now being completed.

Aside from his books and articles, and with a driving passion for IC, Bill has originated SFIC Technical Manuals for national and international lock manufacturers and continues to maintain a working relationship with the major lock and security manufacturers throughout the world. He is a recipient of the ALOA Education Department Service Award in 2012, The ACE Instructor of the Year Award (2014), has volunteered as web designer/webmaster for the ALOA Scholarship Foundation and serves as the North Central Director on the ALOA Board of Directors. Bill is a member of ALOA, ASIS, ILA, LIST Council, LSA and ClearStar, as well as a long-time distributor for Ultra Security and the Owner of **ICLS** [*Interchangeable Core Lock Systems*] located in Metro Detroit and on the internet at: **www. ICLSglobal.com**.